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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,186	09/02/2003	Glen T. Daigger	CH2M.42	5157

25871 7590 10/04/2004

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EXAMINER	
PRINCE, FRED G	

ART UNIT	PAPER NUMBER
1724	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/654,186	DAIGGER ET AL.	
	Examiner	Art Unit	
	Fred Prince	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1203*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Husain et al. (US Pat No. 6,406,629) in view of either Chudoba (US Pat No. 6,077,430) or Sato et al. (JP 4-215892).

Husain et al., directed toward removing biological nutrients from a wastewater yielding a lower phosphorus output, disclose providing a serial multistage bioreactor containing activated sludge having in hydraulic series an anaerobic zone (14), an anoxic zone (18), and a downstream aerobic zone (22), each zone having an upstream inlet and a downstream outlet, providing a wastewater to the anaerobic zone inlet, separating treated water from the activated sludge and phosphorous (col. 5, lines 12-14; Fig. 3) via an immersed membrane (33), wherein the specified concentrations of phosphorus are achieved (Table 2). Husain et al. do not disclose adding a quantity of chemical to precipitate soluble and particulate phosphorous to the downstream aerobic zone and returning activated sludge to the anaerobic zone.

It is submitted that it is conventional in the art of biological nutrient removal to return activated sludge to an anaerobic zone in order to, for example, resupply the anaerobic zone with beneficial bacteria. Accordingly, it would have been obvious for the

skilled artisan to have returned activated sludge to an anaerobic zone in order to, for example, resupply the anaerobic zone with beneficial bacteria, as known in the art.

Chudoba et al., also directed toward removing biological nutrients from a wastewater yielding a lower phosphorus output, disclose adding chemicals to an aerobic zone (3) in order to enhance separation of phosphorus in wastewater by precipitation of phosphorus (col. 2, lines 32-40; col. 4, lines 10-13).

Sato et al., also directed toward removing biological nutrients from a wastewater yielding a lower phosphorus output, disclose adding chemicals to an aerobic zone (3) having an immersed membrane (7) in order to improve the efficiency of phosphorus removal from wastewater by precipitation of phosphorus (abstract).

It would have readily obvious to the skilled artisan to first have modified the method of Husain et al. by adding chemicals to an aerobic zone in order to enhance separation of phosphorus in wastewater or improve the efficiency of phosphorus removal in wastewater by precipitation, as shown by Chudoba et al. and Sato et al.

Regarding a "low phosphorus output", it is submitted that as applicant has failed to define the threshold at or below which a phosphorus concentration is considered to be "low", any phosphorus output which is lower relative to the phosphorus input is considered by the examiner to be a "low phosphorus output".

3. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Husain et al. in view of either Chudoba et al. or Sato et al. as applied to the claims above, and further in view of Daigger et al. (US Pat No 6,517,723).

Husain et al., as modified by either Chudoba et al. or Sato et al., is described above. Husain et al. do not disclose a multistage bioreactor having an upstream anoxic zone, an upstream aerobic zone and a downstream anoxic zone in hydraulic series between the anaerobic zone and the downstream aerobic zone and returning sludge to an anoxic zone and to an anoxic zone to an anaerobic zone.

In any case, Daigger et al., also directed toward removing biological nutrients from a wastewater yielding a lower phosphorus output, disclose the well known concept of providing a multistage bioreactor having an upstream anoxic zone (32), an upstream aerobic zone (34) and a downstream anoxic zone (36) in hydraulic series between the anaerobic zone (30) and the downstream aerobic zone (38) and returning sludge to an anoxic zone and from an anoxic zone to an anaerobic zone in order to efficiently treat concentrated wastewaters (col. 7, lines 56-58).

It would have been readily obvious for the skilled artisan to have modified the method of Husain et al., as modified by either Chudoba et al. or Sato et al., by providing a multistage bioreactor having an upstream anoxic zone, an upstream aerobic zone and a downstream anoxic zone in hydraulic series between the anaerobic zone and the downstream aerobic zone and returning sludge to an anoxic zone and from an anoxic zone to an anaerobic zone in order to efficiently treat concentrated wastewaters, as suggested by Daigger et al.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References are cited of interest to show the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Prince whose telephone number is (571) 272-1165. The examiner can normally be reached on Monday-Thursday, 6:30-4:00; alt. Fridays 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred Prince
Primary Examiner
Art Unit 1724

fgp
9/29/04